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Betsy Peterson, with instructor Fred Renner practicing measuring flow on the Big Thompson.

~Photo by Tina Laidlaw

EPA Labs Support Watershed Work

~by Tina Laidlaw, EPA Region 8

Each year, EPA's Regional labs have provided free analytical support to a limited number of projects to support a number of watershed efforts throughout many states. EPA lab staff work behind the scenes to ensure that samples are analyzed in a timely and accurate manner.

We would like to acknowledge the hard work of the watershed groups, volunteer monitors, and EPA lab staff in supporting watershed efforts. The highlights given below in five articles are just that: highlights. Monitoring forms only one aspect of all of these programs. Each project represents a combination of

diligence, perseverance, and partnership building. These case studies depict the work of watershed groups in multiple states, lab staff in several EPA Regions, and support at local, state, and regional levels. It is through the work of many of these dedicated individuals that environmental protection occurs. EPA and the state agencies cannot accomplish all of the environmental protection that needs to occur, which is why it is so important to mobilize watershed groups, volunteer monitors, and community groups.

For more information about volunteer water quality monitoring, please contact **Tina Laidlaw** at 1-800-227-8917 X6880 or laidlaw.tina@epa.gov

Big Thompson Watershed Forum

~by Tina Laidlaw, EPA Region 8 and Rob Buirgy, Big Thompson Watershed Forum

In 1997, local citizens in Loveland/Fort Collins, CO established the Big Thompson Watershed Forum (BTWF). The Forum's goal is to assess and protect water quality in the watershed. One of the primary activities of the Forum has been the establishment of a paid professional monitoring program. Due to the collaboration of the Forum members, a coordinated monitoring program was designed that maximizes resources and reduces duplication.

A volunteer monitoring program has always been a strong component of the BTWF's activities. Prior to establishment of the Forum, the only basin-wide data available was gathered by student

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Bacteria samples are sent to the EPA Region 8 lab for analysis on a monthly basis for the next two years. Sandie Spence, EPA Region 8 microbiologist, uses the new Colilert method to analyze the samples. The Colilert method is used for the simultaneous detection and confirmation of total coliforms and E.coli in water. Preliminary results show high E.coli bacteria concentrations at some of the downstream sites in the Big Thompson river and its major tributary, the Little Thompson. Potential sources for the high E.coli levels are wastewater discharges and livestock operations. This year, the Forum plans to increase the volunteer monitoring efforts to include nutrient, sediment and macroinvertebrate (bug) sampling.

~by Tina Laidlaw, EPA Region 8 and Karla Brown,
CSU Extension Service

According to CSU Extension Agent and technical advisor for the project, Karla Brown, "Preliminary results indicate that the water quality in our area is good, although the local geology, land use, and hydrology create changes in water chemistry consistent with the journey of that water from mountain streams to farm fields." Generally, data results will be used to assess the overall health of the area's waters, to educate the community about water quality issues, and as a basis for local decision-making.



*~Photo by Teresa Steely,
NFRIA assistant director*



Pine River Watershed Group

~by Tina Laidlaw, EPA Region 8 and Tony Ranalli, USGS

Summer 2001 marked the third sampling season (spanning from May to October) by the Pine River Watershed Group (PRWG). More than 20 volunteers are involved in sampling sites in Vallecito Reservoir and on the Pine River, located in Southwestern CO near Durango. Volunteers collect samples at one reservoir site, at three different depths, and two sites on the Pine River. Samples are analyzed for chlorophyll A (reservoir only), low-level nutrients, and total and dissolved metals. Field measurements for pH, temperature, dissolved oxygen, and specific conductance are also taken by volunteers. Samples are sent to the US Geological Survey (USGS) for analysis with the exception of the metals samples. EPA Region 8's lab has provided the analytical support for metals.

The PRWG formed in 1997 in response to proposed new uses of the water in Vallecito Reservoir and noticed that water quality data was lacking on non-tribal lands. The PRWG partnered with the Southern Ute Indian Tribe, the local community, and state and federal agencies to establish a baseline of water quality data for the watershed. After four years of data collection, the USGS will provide the group an interpretative report on their water quality data. In addition, Tony Ranalli with USGS, gives an annual presentation to the group on the results of their data collection efforts. As a result of examining preliminary data results, the group is considering expanding their sampling efforts to include collection of fish tissue for mercury analysis and analysis of sediment for total metals. The PRWG is working with the Bureau of Reclamation to secure funding to cover analytical costs associated with their sampling effort for 2003.

EPA Region 5 Lab Supports Monitoring on Red River Tributaries

~by Tina Laidlaw, EPA Region 8 and Charlene Crocker, Energy and Environmental Research Center

The Red River flows from its origins at the confluence of the Otter Tail and Bois de Sioux Rivers at Breckenridge, MN and meanders north 550 miles across the ancient bed of glacial Lake Agassiz, with an average gradient of half a foot per mile, forming the border between MN and ND before continuing to its mouth at Lake Winnipeg north of Selkirk, Manitoba. Groups in MN and ND were interested in augmenting data collection efforts already underway as part of the Environmental Monitoring for Public Access and



Volunteers and EERC personnel collect Red River water upstream of the Fargo-Moorhead metro area.

~Photo courtesy of Lindsay Beard, UND

Community Tracking (EMPACT) project, FM River (see <http://www.fmriver.org>).

The Red River Mid-Basin Surface Water Nutrient Loading Assessment Project entailed collecting samples in the Wild Rice Watershed in MN and tributaries to the Red in ND. Starting in June and ending in October, samples were collected at ten sites on the Wild Rice River in MN, four sites on tributaries in ND, and one site on the mainstem Red River on a biweekly basis and shipped to EPA Region 5's lab (in Chicago) for analysis. In MN, school groups were assisted by local Soil and Water Conservation District (SWCD) staff as field measurements for pH, conductivity, turbidity, dissolved oxygen, stage level, and air and water temperature were taken with samples collected on site for shipment to the Chicago EPA lab for analysis of chlorophyll A, ammonia nitrogen, total phosphorus, (nutrients), and total suspended sediment. ND sample parameters included total dissolved solids, total suspended solids, ammonia and nitrate/nitrite nitrogen, and total phosphorus.

The Energy and Environmental Research Center (EERC) was responsible for collecting the ND samples. The project demonstrates both inter-state and inter-EPA Region collaboration. This year marks the first sampling program. The group may continue to collect samples next year with support from EPA Region 5's lab. Through the EMPACT program, groups in the Red River have received funding to conduct monitoring on the mainstem sections of the river. All of the data

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generated through these monitoring efforts will be available to citizens and decision makers through a web-based information sharing clearinghouse. Norman County SWCD District Manager Curt Borchert notes, "Between the great hands-on involvement for local students, professional lab assistance, and data sharing and interpretation; this project is greatly benefiting our understanding and management of our local resources."

EPA Lab Supports Community-Based Sampling Effort in Costilla County, CO

~by Peter Ismert, EPA Region 8

The EPA Region 8 Laboratory, located in Golden, CO, has been analyzing groundwater samples collected by the San Luis Water and Sanitation District (SLWSD) in Costilla County, CO. This is part of a community-based effort to address citizen's environmental concerns. SLWSD and Battle Mountain Resources, Inc (BMRI) are collaboratively monitoring groundwater quality downgradient of the San Luis Mine, owned by BMRI. The Town of San Luis obtains its drinking water from deep groundwater wells and the mine is one of several potential sources of contamination to these wells.

The San Luis Mine lies on the south-eastern edge of the San Luis Valley in the foothills of the Sangre de Cristo Mountains, approximately 4 miles upstream of San Luis, CO along Rito Seco Creek. BMRI operated the San Luis Mine from 1991 until 1997, and is now reclaiming the area as outlined in its mining permit. BMRI's mining operations consisted of two open-pit mines, a cyanide vat-leach mill, and a tailings impoundment. Recently, a surface water discharge permit was issued by the Colorado Department of Public Health and Environment (CDPHE) to BMRI to control contaminated groundwater seeps that flow to Rito Seco Creek. BMRI installed a groundwater treatment system to prevent future unregulated discharges of contaminants to the creek. The San Luis community was concerned about this discharge, which then led to the collaborative effort to monitor the groundwater between the mine and San Luis.

To help address community concerns, BMRI entered into an agreement with SLWSD to install and jointly monitor groundwater monitoring wells between the mine and San Luis. BMRI has been sampling and analyzing groundwater from these wells on a monthly basis since June 2001. The primary goal of the sampling effort is to obtain a baseline condition of the groundwater downgradient of the mine site.

As part of the agreement, SLWSD has been collecting its own samples from the groundwater monitoring wells

at the same time BMRI collects its samples. The EPA lab then analyzes the SLWSD samples in the same manner that BMRI analyzes its samples. After a full year of sampling, BMRI and SLWSD will discuss the sample results. If abnormalities are detected, BMRI and SLWSD will determine if additional monitoring or appropriate followup activities are needed. This effort helps provide additional confidence to SLWSD as to the viability of their drinking-water source and will provide an early warning to San Luis in the event that contamination were to move beyond the mine site toward the drinking water wells.

EPA Region 8 and CDPHE both promote this approach where local entities identify and address their own environmental issues. Both agencies have provided assistance in designing the monitoring plan and are encouraged by the collaboration between BMRI and SLWSD to take necessary actions to ensure San Luis's drinking water remains safe from potential sources of contamination. Ms. Jaunita Bernal of SLWSD states, "The San Luis Water and Sanitation District board of directors and staff appreciate and thank EPA for their concern and assistance in testing the District's monitoring well samples in order to ensure the safety and good quality of the drinking water that we provide for our consumers."

Missouri River Currents: Tribal Environmental Justice: Preserving Cultural Resources in the Missouri River Basin

~by Roxanne Ornelas, EPA Region 8

The preservation of tribal cultural resources in the Missouri River Basin is an issue that has historically received little attention from government agencies. EPA is committed to working with Missouri River Basin tribes toward improved recognition and resolution of tribal cultural resource concerns. EPA's role in the National Environmental Policy Act (NEPA) process is to comment on the environmental impacts of proposed major federal actions. One such action is the US Army Corps of Engineers' proposed revision to the Master Manual of Operations, which governs the system of dams and reservoirs on the main stem of the Missouri River. Among other concerns, EPA Regions 7 and 8 have raised questions about tribal water quality, disclosure of water quantity impacts, and impacts to tribal cultural resources. Additionally, EPA Region 8 has awarded a grant to the Lower Brule Sioux Tribe to allow Tribal elders to identify the locations of culturally sensitive areas on the Reservation. The geographic information system (GIS) data that will be developed will be used to support tribal decision making about development.

Tribal cultural resources include the land, human remains, funerary objects, tribal cultural objects and items, medicinal plants, wildlife, sacred sites and architecture, as defined by the Native American Graves Protection and Repatriation Act of 1990. "Anything tied to the ongoing survival of our culture is a cultural resource," says Scott Jones of the Lower Brule Sioux Tribe.

Tribal cultural resources being threatened in the Missouri River Basin are significant. For example, the operation of the Missouri River dam and reservoir system has led to excessive erosion of river banks and reservoir shorelines that are rich in cultural sites. The loss of land along the river has led to the ruination and desecration of tribal ancestral grave sites. Impairments to the quality of Missouri River water cause the degeneration of aboriginal plant and wildlife habitats, as well as impacting the health of tribal members. Availability of high quality water is essential for supporting tribal health, economy and cultural life.

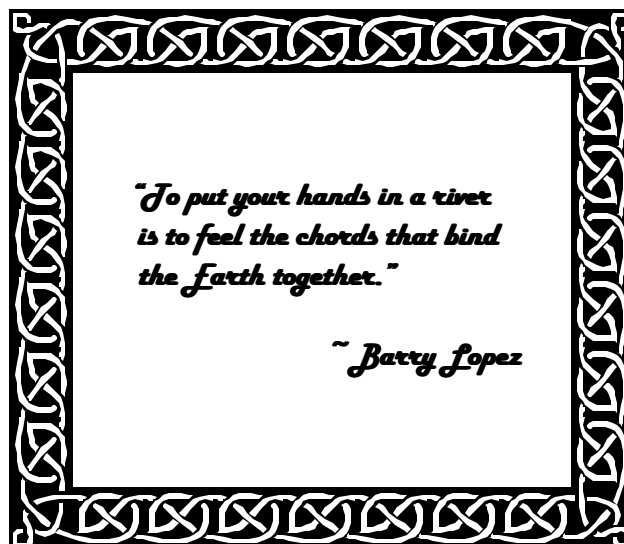
The destruction of tribal historic sites threatens the very history and culture of tribes in the Basin. Ancient historic sites and architecture, once destroyed, are gone forever. Animals are considered a sacred part of life and are often an important food source for many of the tribes. Tribal ceremonies and celebrations are held to honor the taking of an animal. Maintaining wildlife along the Missouri River secures an essential part of tribal life and culture. Aboriginal plants are mainstays of tribal diet and health maintenance and often have ceremonial uses. Plant habitats are being lost in many parts of the Missouri River Basin.

Why are impacts to sacred places, plants, animals and landscapes part of environmental impact review? Under NEPA, the definition of environment states that "Human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment."

What makes the impacts significant? The determination of significance requires a focus on both context and intensity. Context is the society, region, interest or locale. Intensity is the severity of the impact.

The goal of tribal environmental justice in the Missouri River Basin includes the preservation of tribal cultural resources. The preservation of tribal cultural resources, and the protection of the natural environment, would not only benefit tribes today, but provide a legacy for future generations.

For more information please contact: **Roxanne Ornelas** at 1-800-227-8917 X6740 or **Deldi Reyes** at X6055



Missouri River Science: Meeting the Challenge of Change, 6th Annual Missouri River Natural Resources Conference
April 21-24, 2002, South Sioux City, Nebraska

This year's conference will focus on the challenge of understanding the processes of a large dynamic river system. Papers, posters and speakers will address how river management can respond to new scientific information. Keynote speakers include Brian Richter of The Nature Conservancy's Freshwater Initiative and David Galat, river ecologist with the University of Missouri. Field trips will feature endangered least tern and piping plover habitat, Gavin's Point National Fish Hatchery where endangered pallid sturgeon are raised, and habitat restoration sites on the channelized river.

For more information call 573-876-1876 or check:
<http://infolink.cr.usgs.gov/events/02.htm>

Smart Growth Strategies Booklet
~Contributed by Paul McIver, EPA Region 8

The National Association of Counties has produced a booklet entitled "Smart Growth Strategies: Protecting Water Resources. Local Government Roles and options for the Rocky Mountains and Northern Great Plains." This colorful and informative booklet, funded by the U. S. Environmental Protection Agency, is available from the National Association of Counties, 440 First Street, NW, Washington, D.C. 20001. Their phone number is 202-393-6226. Limited copies are available from EPA Region 8. For more information please contact Paul McIver at 1-800-227-8917 X6056 or mciver.paul@epa.gov

Grant Opportunities

~From The Sonoran Institute's Conservation Assistance Tools Winter Newsletter

American Rivers- NOAA Community Based Restoration Program Partnership Grants

American Rivers is seeking proposals for community-based river restoration grants as part of its new partnership with the National Oceanic and Atmospheric Administration (NOAA) Community-Based Restoration Program. These grants are designed to provide support for local communities that are utilizing dam removal or fish passage to restore and protect the ecological integrity of their rivers and improve freshwater habitats important to migratory (anadromous) fish. The application deadline is April 1, 2002. For more information, including application guidelines, visit <http://www.amrivers.org/feature/restorationgrants.htm> or contact Peter Raabe with American Rivers at rivergrants@amrivers.org

The Five-Star Challenge Grant Program

The Five-Star Restoration Program provides modest financial assistance on a competitive basis to support community-based wetland, riparian, and coastal habitat restoration projects that build diverse partnerships and foster local natural resource stewardship through education, outreach, and training activities. In 2001, 60 projects received grants of on average \$10,000 out of approximately 230 applications received. The application deadline is March 1, 2002. For more information, including an application form, visit: <http://nfwf.org/programs/5star-rfp.htm>

"Anything else you're interested in is not going to happen if you can't breathe the air and drink the water. Don't sit this one out. Do something. You are by accident of fate alive at an absolutely critical moment in the history of our planet."

~Carl Sagan

Watershed Management: How TMDLs and the Clean Water Act Fit

~by Karen Hamilton, EPA Region 8

What is all the flurry and worry over these T...M...D...Ls? What does Total Maximum Daily Load mean anyway? And, especially, what does it mean to me? This is the third article in a series about the Clean Water Act and how it relates to watershed efforts.

A few issues ago in Natural News (Winter 2001) I described how parts of the Clean Water Act (CWA) address the activities you would do while managing water quality on a watershed basis. In that article I used this chart:

GENERIC PROCESS

Set water quality goals
Monitor water quality

Assess and allocate pollutant loadings
Implement protection and restoration measures
Evaluate goal attainment and adapt management

CLEAN WATER ACT

Water Quality Standards
305(b) Reports, 106, volunteer monitoring TMDLs

Permits, BMPs

Grants (319, 104(b)(3), SRF, etc.), 305(b)

In a previous issue of Natural News (Spring 2001), I described what CWA water quality standards are and how they can help goal setting for your watershed work. In the CWA, water quality standards **are** the goals for the rest of the water quality framework. Water bodies are monitored by State and Tribal water quality agencies to determine if the standards (designated uses, narrative and numeric criteria) are being met. If any one of these parts of the standards that the State or Tribal agency applied to the water body are not being met, then that water body is considered "impaired." The CWA requires the State or Tribal water quality agency to create a list of water bodies that are impaired (required by Section 303(d) of the CWA) and submit it to the EPA for approval. This is the "303(d) list."

The CWA requires that the State and Tribal water quality agencies then develop a "Total Maximum Daily Load" (pollution budget) for each water body that is impaired. EPA had not been requiring State and Tribal agencies to develop these TMDLs. In the 1990's lawsuits were successfully brought against EPA for not requiring the State water quality agencies to develop the TMDLs. The results of the lawsuits, which now number 36 across the nation, were court orders for EPA to develop TMDLs, usually through the State agencies, on difficult schedules. To meet the schedules, EPA and the States have had to significantly change the focus of their water quality work - hence, the flurry. This has been

noticed by many people, but sometimes the reasons for this change and the purpose of a TMDL are not clear - hence, the worry.

So, alright, already. A TMDL is *the maximum amount (load) of a pollutant (e.g., ammonia) that a water body can receive and still meet water quality standards*. It is calculated by adding the loads of that pollutant from permitted discharges (point sources) and runoff (nonpoint sources) and a margin of safety. This is the *allocation* part of the TMDL; the maximum amount is allocated among the different sources of the pollutant.

The need for a TMDL is driven by the standard, or the goal, for the water body. The TMDL creates a **target** to aim for in order to meet the standards. The target is met by finding ways to reduce the load of the pollutant. These methods are called controls and might be regulatory or rely on voluntary efforts. However, the TMDL itself is not a regulatory requirement to put controls in place.

Here is a chart of the relationship between standards, TMDLs, and controls using some examples of different pollutants and situations:

CWA 303(c) <u>Standard or end point</u>	CWA Section 303(d) <u>TMDL Target</u>	CWA 402 or 319 <u>Controls</u>
1. 29 ug/l-N (ammonia)	7.2 lbs ammonia/day	Improved waste water treatment at one source.
2. 7.4 ug/l phosphorus;	10,165 lbs P/year	Improved waste water treatment. (Impaired recreation use) Best management practices to reduce runoff from urban areas and construction sites.
3. 20ug/l phosphorus	50% reduction in P	Livestock feeding best management practices. Streambank restoration. Cropland best management practices.
4. Salmonid spawning use 30% substrate fines >73F in only 10 days annually 3,000 returning females/yr	Sediment load same as reference reach 50% reduction in erosive banks 3-9cfs min flow	Grazing BMPs. Channel restoration. Riparian restoration. Irrigation withdrawal BMPs.

Sometimes a water body has several pollutants that are affecting its standards. In that case, there will be a TMDL for each pollutant. CWA Section 303(d) has no implementing authorities. The TMDL target is usually met with a mixture of regulatory and non-regulatory tools. At its simplest, the total source of a pollutant would be a permitted discharge (e.g., 1 above) and the control would be to increase the requirement of the permit. When the source of a pollutant is several sources of runoff not requiring a permit (e.g., 3 and 4 above), the control measures will rely on collaboration among many people and organizations to put in place voluntary best management practices. When the sources are mixed (e.g., 2 above) both regulatory and voluntary tools can help control the pollutant.

To develop a TMDL can require a significant amount of water quality and other watershed data that may not exist. Models may also have to be used to allocate loads among sources and determine what the TMDL target should be to meet the water quality standard. To make the TMDLs as scientific as possible, a large amount of effort may be needed to develop each TMDL. Because of the court orders or settlement agreements that require so many TMDLs to be calculated in many states, the work is greater than the amount of money and people available. Some locally driven watershed groups have expressed interest in contributing to the effort to develop the data for calculating a TMDL on the water body they are working on. In other watersheds, the data watershed groups have developed through volunteer monitoring efforts has been used to calculate a TMDL, or coalitions have helped develop and implement best management practices for nonpoint sources.

For more information on TMDLs go to:

<http://www.epa.gov/region8/water/tmdl.html> or <http://www.epa.gov/owow/tmdl>



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If you have an article concerning ecosystem protection, community based environmental protection, or watersheds; we would like to hear from you!

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Ecosystem Stewardship on the web: http://www.epa.gov/region08/community_resources/steward/est/est.html



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